The Journal of THE ROYAL AERONAUTICAL SOCIETY



SEPTEMBER 1947 NO 441 · VOL. 51



He knows where he is with Kelvin Instruments . . . he knows that a Kelvin pointer, moving across a Kelvin dial, will give him accurate information ... clearly ... quickly ... whenever he needs it. Kelvin reliability is built on years of accumulated experience and organised research. It is backed by a tradition of accuracy inspired by the genius of Lord Kelvin, master of measurement. That is why Kelvin aircraft instruments are being specified for high speed aircraft now being built in this country.



KELVIN BOTTOMLEY AND BAIRD LIMITED • BASINGSTOKE

THE CAPACITY TO DO

THE COURAGE TO THI

) ôle of the

HAWKER SIDD

As research grows more and more important in aviation, so does it become more and more difficult.

The idea behind the Hawker Siddeley Group is to make available to each member-company a variety and scope of technical experience, and resources, far beyond the practicable horizon of any company as an individual. Each company manages its own affairs; yet together they form a co-operative team which not only gives to each, in world markets, the strength of the whole, but provides also a pool of aviation technique, resources, and facilities, that to-day is unique.

ROUP

A. V. ROE & CO. LTD • HAWKER AIRCRAFT LTD • GLOSTER AIRCRAFT CO. LTD SIR W. G. ARMSTRONG WHITWORTH AIRCRAFT LTD • ARMSTRONG SIDDELEY MOTORS LTD A. V. ROE CANADA LTD • AIR SERVICE TRAINING LTD • A. W. HAWKSLEY LTD

HAWKER SIDDELEY AIRCRAFT CO. LTD., 18 ST. JAMES' SQUARE, LONDON, SWI

Exact information, responsible commentaries and topical illustrations are among the features which have given these four representative Temple Press Publications positions of authority in the world of aviation.

SPITEFUL

VICKERS - ARMSTRONGS INCRAFT SECTION SUPERMARINE WORKS

SEAFIRE

SPITFIRE

OPLAN

聞思

10802

TEMPLE PRESS LIMITED

BOWLING GREEN LANE, LONDON, E.C.1. TERMINUS 3636



astics

The Decca Navigator Co. Ltd.

invite you to visit their Stand No. 107

in the Static Exhibition Section

of S.B.A.C. Flying Display 1947

at Radlett, Herts., September 9th to 13th

where The Decca Navigator

will be available for your inspection

The Decca Navigator Company, Limited

I-3 BRIXTON ROAD, LONDON, S.W.9 Telephone : Reliance 3311 Cables : Decnav London



WORLD WIDE AUTHORITIES COVERING EVERY PHASE OF DESIGN, OPERATION AND PRODUCTION OF ALL TYPES OF AIRCRAFT FLIGHT (weekly) provides the most authentic information on world aeronautical affairs. It covers every aspect of development and progress in aircraft and power unit design and operation. AIRCRAFT PRO-DUCTION (monthly) is the journal of the aircraft manufacturing industry, specialising in tools and works production processes. Both journals serve the interests of all concerned with the future progress of British aviation. Technical information is supplemented by brilliant functional drawings. Circulation is world wide. Annual subscriptions (Home and Overseas) : FLIGHT, £3 Is. od. ; AIRCRAFT PRODUCTION, £1 145. 6d.

LI 14s. 6d. Published in conjunction with these journals, FLIGHT HANDBOOK (212 pages, 7s. 6d. net) is essentially a manual for the student, whilst GAS TURBINES AND JET PROPULSION (272 pages, 12s. 6d. net) by G. Geoffrey Smith, has been widely adopted as the standard text on the subject.





DORSET HOUSE, STAMFORD STREET, LONDON, S.E.I. WATERLOO 3333 (50 LINES)

vi

Silicone products manufactured by the Dow Corning Corporation are now available in this country. They include:

SILICONES

D.C. SILICONE FLUIDS D.C. SILICONE RESINS D.C. SILICONE GREASES D.C. SILASTIC RUBBER

Stocks are sufficient to meet demands for sample and trial purposes. Further supplies are on the way.

Enquiries for D.C. stopcock greases and Silicone fluids for high vacuum diffusion pumps should be addressed to Messrs. W. Edwards & Co., Kangley Bridge Road, Lower Sydenham, S.E.26, who are the sole distributors of these particular products.

For all other Silicone compounds please apply to



ALBRIGHT & WILSON

Distributors of Dow Corning Silicones 49 PARK LANE, LONDON, W.1 Telephone: Grosvenor 1311

' BW / 2 SL

LTD

STRENGTH & LIGHTNESS/



With the first chill of approaching winter, flocks of the Pacific Golden Plover may be seen leaving the Aleutians to make landfall 40 hours later on Hawaii—an incredible non-stop flight of 2,000 miles.

The pioneering of light metals by James Booth & Company Limited in almost every development in aviation in this country—from the days of the first airships to the present time—has played no small part in enabling man to emulate by mechanical means the feat of the Golden Plover.

Our experience is at your disposal for the asking.



DURALUMIN · ALDURAL · DURAL · MG7

Registered Trade Marks

JAMES BOOTH & COMPANY LTD., ARGYLE ST. WORKS, BIRMINGHAM 7

viii

Bombay to Cairo 2870 miles, in 14 hrs. 55 mins. (one day) Rangoon to Vizagapatam 880 miles, across the Bay of Bengal. Broome to Singapore 1910 miles, in one day.

Sydney to Auckland 1350 miles, across the Tasman Sea.

rmstrongs

imited

e Log

The strenuous schedule maintained during the recent Empire tour of a Vickers Viking included a number of outstanding individual flights. Many were over open water and off the usual air-line routes — an indication of the confidence inspired by the Viking's standard of performance. The total distance flown was 40,000 miles, including 11,000 miles

Vick

of demonstration flights. Although a full complement of spares was carried, the flight was trouble-free.

AIRCRAFT SECTION, VICKERS HOUSE, BROADWAY, LONDON, S.W.I. SHIPBUILDERS * ENGINEERS * AIRCRAFT CONSTRUCTORS

Paa 1922 · 1926 1928 . 1931 1935 . 1938

In Empire Air Development

FIRST Aircraft to be manufactured in Australia under licence from overseas . . . a DH50A, built by Qantas at Longreach **1926**

FIRST Flying Doctor service established in Australia by Qantas at Cloncurry . . . **1928**

FIRST Four engined Plane used in Australia

..... by Qantas on Brisbane-Singapore service (a DH86). 1935

FIRST Through Flying Boat service to Singapore by Qantas, and — in association with Imperial Airways — to London . . 1938

FIRST With B.O.A.C. and Tasman Empire Airways, to re-establish the British Air Route . . . to help maintain British Empire Air supremacy in the revolutionary developments in the Age of Flight 1946

AUSTRALIA'S INTERNATIONAL AIRLINE Qantas Empire Airways

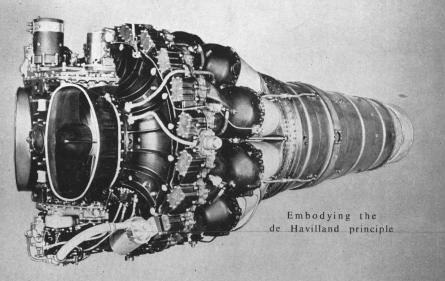


THE FAIREY AVIATION COMPANY LIMITED, HAYES, MIDDLESEX London Office: 24 Bruton Street, London, W.I. Mayfair 8791.



G H O S T

First gas turbine to be chosen for a jet airliner

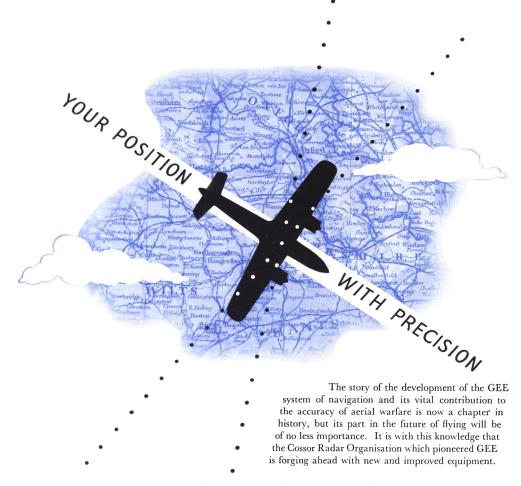


The best on all counts

High air-intake efficiency Low aircraft drag Low installed weight Low fuel consumption Maximum accessibility Low fire risk

DEHAVILLANDJETENGINES

xiii



The Pulse System of Hyperbolic Navigation



Enquiries regarding GEE should be addressed to:-Cossor Radar Ltd., Highbury, London, N.5.

CGI

ESIGNED for a decade of service, the Ambassador has been planned expressly for use on the inter-city, medium-length stages which will always carry the bulk of the world's air traffic. Larger than aircraft at present being used over such stages, yet smaller than those for long-distance or trans-oceanic flying, the Ambassador carries up to forty-eight passengers in comfort and safety at a high cruising speed. By refinement of design an excellent performance has been obtained for a low expenditure of power, so that the Ambassador is an economically attractive proposition. A very wide range of weakmixture cruising speeds permits schedules to be maintained in all conditions. A high power-weight ratio offers an unusually good single-engine performance. There is nothing "interim" about the Ambassador. Designed for to-day and to-morrow, its modern features include a pressurized and air-conditioned fuselage; a high wing for easy loading, thermal anticing; braking propellers; a steerable tricycle undercarriage with duplex wheels; integral tanks; and completely self-contained and interchangeable power plants. Looking further into the future, the Ambassador has been designed so that it can take propeller-turbine units when these are available for commercial use. AIRSPEED 28-48 Seater AIRSPEED LIMITED, CHRISTCHURCH & PORTSMOUTH, HAMPSHIRE, ENGLAND BIRSPEED ASSOCIATED COMPANIES IN AUSTRALIA, CANADA, INDIA, AFRICA & NEW ZEALAND

Two Outstanding Books

. from Pitman's

METEOROLOGY TROPICAL & EQUATORIAL

By Maurice A. Garbell. The subject of weather analysis has hitherto only been covered by statistical and climatological studies. In this book much new material, both theoretical and observational, has been introduced, including the very latest concepts and findings. It contains many excellent charts and photographs. 60s. net.

Engineering Applications of TERRESTRIAL PHOTOGRAMMETRY

By B. B. Talley. An expert American writer presents the subject in a manner most useful to advanced students and practising surveyors and engineers. He explains each step necessary to produce a finished map or mosaic, and deals fully with the many practical applications of photogrammetry. Well illustrated. 40s. net.



London WC2 Parker Street Kingsway



THE AIRSPEED AMBASSADOR - aptly named for its future role of carrying British air prestige across the continents of the world — uses Exide exclusively. A battery that couples lighter weight with greater capacity and better performance with longer life, is the natural choice for modern aircraft.

The following aircraft are fitted with EXIDE Batteries as initial equipment :

AIRSPEED AMBASSADOR AIRSPEED CONSUL AVRO TUDOR I AVRO TUDOR II BRISTOL FREIGHTER BRISTOL WAYFARER CUNLIFFE-OWEN CONCORDIA HANDLEY PAGE HALTON HANDLEY PAGE HERMES

MILES AEROVAN MILES GEMINI MILES MARATHON MILES MESSENGER PERCIVAL PRINCE PERCIVAL PROCTOR SHORT SANDRINGHAM 'V' SHORT SOLENT SHORT SEALAND

AQB

VICKERS VIKING



THE CHLORIDE ELECTRICAL STORAGE COMPANY LIMITED, EXIDE WORKS, CLIFTON JUNCTION, NR. MANCHESTER

xvi

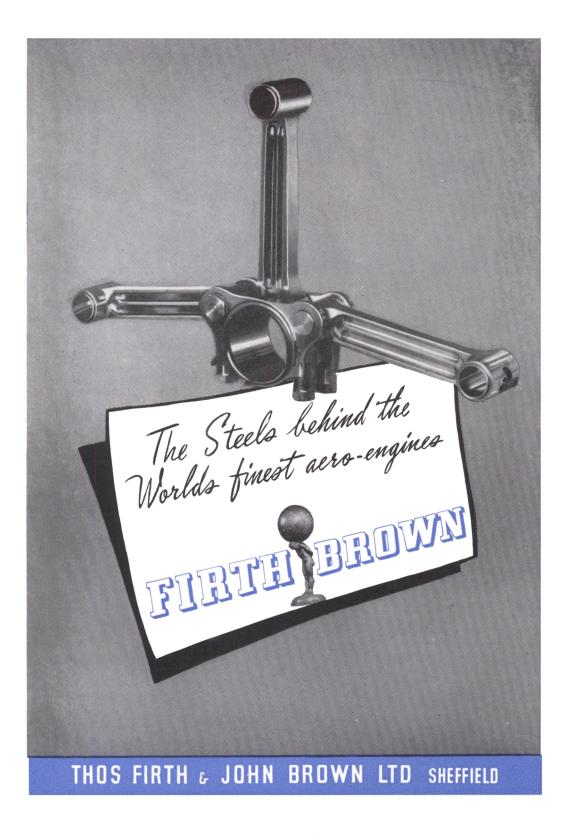
S·B·A·C EXHIBITION RADLE

allenders Prond

We manufacture all types of electric cables including aircraft cables and radio frequency cables. Also moulded connectors, flexible waveguides for radar, aluminium sheets and sections, solder and soldering fluxes and Callender-Hamilton aircraft hangars.

All the above items will be shown on Stand No. 55 at the Static Exhibition, Radlett.

BRITISH INSULATED CALLENDER'S CABLES LIMITED NORFOLK HOUSE, NORFOLK STREET, LONDON W.C.2



xviii

THE JOURNAL OF THE ROYAL AERONAUTICAL SOCIETY

With which is incorporated The Institution of Aeronautical Engineers

CONTENTS

SEPTEMBER 1947

THE BEHAVIOUR OF STRUCT	URES UNDE	R REPEA	TED	
LOADS By A. G. Pugsley, O.B.E., D.S	c., F.R.Ae.S.	::	::	715—720
GUSTS				
By W. Tye, B.Sc., F.R.Ae.S.	:: ::	::	::	721—732
HIGH SPEED AIRCRAFT FLYING LIMITATIONS AND HANDLING PROBLEMS				
By F. W. Morgan, B.Sc., A.R.	Ae.S. ::	::	::	733—738
THE USE OF RHEO-ELECTRICAL ANALOGIES IN CERTAIN AERODYNAMICAL PROBLEMS				
By L. Malavard ::	:: ::	::	::	739—756
THE GENERAL THEORY OF CYLINDRICAL AND CONICAL				
TUBES UNDER TORSION AND BENDING LOADS, PART V				
By J. Hadji-Argyris, D.E., A.F.R.Ae.S. and P. C. Dunne, B.Sc.,				
A.F.R.Ae.S. :: ::	:: ::	::	::	757—783

The Journal is published monthly at the Offices of the Society, 4 Hamilton Place, Piccadilly, London, W1. None of the papers or paragraphs must be taken as expressing the opinion of the Council of The Royal Aeronautical Society unless such is definitely stated to be the case. Subscriptions per annum, £4 13 0 including postage; Single Numbers 7/6 or 7/9 post free. All communications for publication or Advertisements in the Journal, or on general matters affecting the Society should be addressed to---The Secretary, J. Laurence Pritchard, 4 Hamilton Place, W1. The Society's Bankers are Messrs. Coutts & Co.

Telephone: Grosvenor 3515 (5 lines) Telegraphic Address: Didaskolas, Audley, London.

